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Upcoming events and conferences

Compiled by the Pacific Seabirds Committee

Title: [Island Invasives 2026](#)

Location: Aotearoa, New Zealand

Date: February 9 - 13, 2026

Title: [Ocean Sciences](#)

Location: Glasgow, Scotland

Date: February 22 - 27, 2026

Title: [12th International Penguin Conference](#)

Location: Phillip Island, Australia

Date: August 31 - September 5, 2026

Title: [World Seabird Conference](#)

Location: Hobart, Tasmania

Date: September 7 - 11, 2026

Member updates

Maui Nui Seabird Recovery Project

Submitted by: Jay F. Penniman, <https://mauinuiseabirds.org/>, mauinuiseabirds@gmail.com

Jennifer (Jenni) K. Learned has moved from Operations/GIS Specialist to Project Manager for the Maui Nui Seabird Recovery Project.

Jay F. Penniman has moved from managing the Maui Nui Seabird Recovery Project to Special Projects/Development Specialist.

Cecelia (Cece) E. Frisinger has become Project Coordinator for the Maui Nui Seabird Recovery Project.

The mission of the Maui Nui Seabird Recovery Project is:

“Working to locate, protect, and enhance seabird populations and habitats in Maui Nui and throughout the state of Hawai‘i”

Lindsay Young

Submitted by: Lindsay Young, VP Research, National Geographic Society, lyoung@ngs.org

Lindsay Young recently transitioned to the National Geographic Society where she is the Vice-President of Research for the Pristine Seas program. The Pristine Seas team works with local communities, Indigenous Peoples, government, and partners to create large-scale marine protected areas globally. To date, the program has created 29 marine protected areas (MPAs) protecting more than 6.7 million square kilometers. For the next three years, Pristine Seas will focus on the tropical Pacific. As part of this program, we will be expanding our data collection techniques to include colony-based surveys of nesting seabirds in the geographies we visit, as well as a special satellite tracking program of Wedge-tailed Shearwaters (*Ardenna pacifica*). We plan to satellite track shearwaters in each country we visit in order to inform MPA boundaries and complement our underwater data collection, which spans from the intertidal down to 6,000 m. A special project on our upcoming 2025 expedition to Fiji will include the first attempt to capture and satellite tag Fiji Petrels (*Pseudobulweria macgillivrayi*) in partnership with Birdlife International and Nature Fiji in an effort to locate montane breeding colonies and inform connectivity between marine and terrestrial habitats.

Mark J. Rauzon

Submitted by: Mark J. Rauzon, Laney College

Mark J. Rauzon is retiring from Laney College, Oakland, CA after 17 years as a tenured professor in Geography. Mark was a recent recipient of Stanford University's Education Partnership for Internationalizing Curriculum (EPIC) where the Bering Sea climate chaos was used to explore Ecology, Geo-politics, Energy Economics, etc. In retirement Mark is weaving this information into a book about the Bering Sea to be published by University of British Columbia. Here is Mark at his retirement party rapping about the water cycle: <https://www.youtube.com/shorts/gj0Z7JdlTsl>.

Content submissions

Edible art

Submitted by: Stephanie Crawford, University of Alaska Fairbanks



Blue-footed Booby (BFBO) with Galápagos Penguin (GAPE) in background #1



Blue-footed Booby (BFBO) with Galápagos Penguin (GAPE) in background #2



Common Murre (COMU) with egg



Crested Auklet (CRAU) with Tuffin Puffin (TUPU) in background



Magnificent Frigate (MAFR) with Galápagos Penguin (GAPE) in background



Marbled Murrelet (MAMU)



Pigeon Guillemot (PIGU) dive



Red-legged Kittiwake (RLKI) with Horned Puffin (HOPU) in background



Tufted Puffin (TUPU)

The Owl Gull: Swallow-tailed Gulls' Exclusive Nocturnal Foraging

Submitted by: Sebastian Cruz, American Bird Conservancy

Most seabirds rely on daylight for foraging, but the Swallow-tailed Gull (*Creagrus furcatus*), near-endemic to the Galápagos Islands, has evolved a remarkable exception — it is the only fully nocturnal foraging gull in the world.

Using GPS tracking, our study confirms what previous observations suggested: Swallow-tailed Gulls head out to sea exclusively at night, traveling up to 100 km offshore to feed on squid and lanternfish that vertically migrate to the surface after dark. By analyzing movement patterns across multiple breeding colonies over three years, we found strong spatial fidelity to specific foraging areas and differences in trip lengths and behaviors between colonies.

Nocturnal foraging may reflect an evolutionary trade-off. The gulls' specialized large eyes synchronize activity with the lunar cycle, and avoidance of daytime predators like frigatebirds highlight the challenges and benefits of an exclusively nocturnal lifestyle. In tropical waters, nighttime productivity increases significantly due to diel vertical migration, as prey such as squid and lanternfish move to the surface. By foraging at night, Swallow-tailed Gulls exploit a relatively empty niche for seabirds in the Eastern Tropical Pacific.



An eyewitness account of two Pigeon Guillemots (*Cepphus columba*) chicks fledging from their nest

Submitted by: Maria M. Ruth and Susan Morgan, Salish Sea Guillemot Network, Olympia, Washington

On the evening of August 11, 2024, two Pigeon Guillemots (*Cepphus columba*) were observed departing from their nesting burrow located in an erosional bluff on Eld Inlet, near Olympia, Washington. The burrow is among several in an active Pigeon Guillemot breeding colony located along a 2,000-foot stretch of privately owned beach backed by partly vegetated erosional bluffs. The burrow was approximately 12 feet above a sand-and-gravel beach and visible with the naked eye.



At 8:24 p.m., the observer witnessed the first chick flying from the direction of the burrow directly toward the water where it landed an estimated 60 feet from the tide line and immediately dove and was lost to sight. The rising tide was at +10.9 feet, which exposed approximately 40 feet of the beach between the base of the bluff and the water line. The fledging bird therefore flew a total distance of approximately 100 feet on a straight and direct trajectory from its burrow to the water. No other guillemots were observed on the water or in the vicinity of the burrow before or after the chick fledged.

The observer then climbed into a multi-trunked red alder tree approximately 40 feet tall. The alder was rooted in the base of the bluff, with its main trunk growing at a 45-degree angle and extending its branches over the beach. Several days earlier, the observer discovered that certain branches were sturdy enough to climb and afforded an eye-level view of the entrance to the guillemot nesting burrow and of several inches of the burrow interior. From this vantage

point, the distance between the observer and the burrow was approximately 20 feet. The alder was fully leafed out and provided camouflaging cover for the observer.

Starting at 8:26 p.m., the second chick was observed sitting at the entrance to the nest, lifting its wings, stretching its wings behind it, peering over the edge of the nest and toward the water. Sunset occurred at 8:27 p.m. At 8:34 p.m., the chick stepped to the edge of the burrow entrance, turning its head in all directions at the bluff, peering and leaning forward toward the water, lifting and stretching its wings behind it. Civil twilight ended at 9:01 p.m. At 9:03, with no preparatory wing flapping, the chick launched itself quickly from its nest. It flew quickly, directly to the water approximately 30 feet from its burrow to the water. The tide was then +12 feet, exposing an estimated 30 feet of beach from the base of the burrow to the water line. The total distance of this flight is estimated at 60 feet.

The observer described this flight as “graceful,” and the bird as a “silent white streak.” The event occurred so quickly, she reported, that she would have “missed it if she had blinked.”

Neither the first or second fledging chick flapped their wings on their initial flight. As with the first chick, the second chick immediately dove after it landed on the water and disappeared from sight. Neither chick was observed in the offshore waters in the vicinity of the bluff during several days after the fledging event.

The observer is a volunteer surveyor with the Salish Sea Guillemot Network, a community-science project that has trained volunteers to collect scientific data on breeding Pigeon Guillemots in the Salish Sea since 2003. The burrow described here was first monitored in 2018. Adult guillemots were observed visiting the burrow in 2018 and 2019, but no fish deliveries were observed (an indication of the presence of chicks). No adults visited the burrow in 2020. Official summer surveys were discontinued after 2020 due to lack of guillemot activity.

Observations reported here were made irregularly beginning on June 22, 2024, when an adult guillemot was seen flying into the burrow described here. On June 25, an adult could be seen sitting inside the burrow entrance. On August 3, chicks in their juvenile plumage were observed moving to the burrow entrance just prior to the delivery of a gunnel (*Pholis* spp.). Daily and nightly watches of this burrow began at this time. Over the next nine days, fish deliveries continued with multiple deliveries throughout the day, just after sunrise to after dusk, with two adults delivering fish nearly simultaneously to the burrow. Fish were either gunnel or sculpin (*Cottioidea* spp.). By August 8, the chicks were observed at the entrance of the burrow outside the fish-delivery period and audibly vocalizing when fish were delivered. On August 10, chicks were increasingly active near the burrow entrance and were observed stretching out their wings, preening, and peering out the entrance in different directions. On August 11, the night of the fledging, the adults delivered fish to the burrow at 7:08 p.m., just an hour prior to the departure of the first guillemot chick. No adult guillemots were observed in the vicinity of the burrow or holding fish to lure the chicks from the nest as has been documented in the literature.

Eye-witness observations of Pigeon Guillemot fledging behavior are rare and/or rarely documented. The species account of the Pigeon Guillemot, published in 1993 in *Birds of North America* (now *Birds of the World*), states that fledging occurs “[M]ostly at night or in late evening, independent of parents...but sometimes during the day in Washington” and that the young “scramble, or fly clumsily down to the water...”. That young guillemots “fly clumsily” is supported by a single cited account stating that some birds “merely waddled to a position where they could drop into the water without even becoming airborne and flew considerable distances before splashing into the water with a series of ‘skips’...” and “even flipped over three times before coming to a stop.” Other birds “left the nest and flew rather erratically and unstably into the water.”

The observations presented here offer alternative and supplemental details.

Updates from the Ornithological Council

Submitted by: Laura Bies, Ornithological Council

The Pacific Seabird Group is part of the Ornithological Council (OC), a consortium of scientific societies of ornithologists. We’re here to support our societies and their individual members with resources, community action, and individual assistance.

The OC is currently developing a new edition of the [Guidelines to the Use of Wild Birds in Research](#). This foundational publication provides an in-depth guide to animal welfare considerations when performing research involving wild birds, including ethical considerations and the legal framework that researchers must follow. We are looking for volunteers for chapter authors and peer reviewers. If you are interested in volunteering, please contact Laura Bies (laurabiesoc@gmail.com). Graduate students and early career professionals are encouraged to volunteer. If you know of a recent methods paper relevant to a topic covered in the Guidelines, please submit the citation (and if possible, a PDF or link to the paper) to Laura Bies. Also welcome are papers that are not method papers per se but assess the impact of the study methods.

You can learn more about the actions that the OC is taking to support ornithologists on the Ornithology Exchange, in the “[News from the Ornithological Council](#)” forum. There you’ll also find timely articles about policy issues that affect ornithologists.

Please feel free to reach out to OC Executive Director Laura Bies at laurabiesoc@gmail.com if we can be of assistance!

US Policy Updates

Submitted by Annie Chester, American Bird Conservancy

From executive orders to proposed rulemakings and legislation, many actions have an impact on seabird conservation. Here are the latest updates, as of March 2025:

Migratory Bird treaty Act

The Solicitor's Office of the Department of Interior suspended all Biden-era legal opinions, including [M-37065](#), which affirms the inclusion of incidental take under the Migratory Bird Treaty Act. If this suspension becomes permanent, incidental take will no longer be enforced.

Over 1,000 bird species are [listed under the MBTA](#). Among the many protected seabirds are Magnificent Frigatebird (*Fregata magnificens*), Laysan Albatross (*Phoebastria immutabilis*), and Spectacled Eider (*Somateria fischeri*).

Johnston Atoll

The Department of the Air Force (DAF) issued a [notice of intent \(NOI\)](#) to prepare an Environmental Assessment (EA) for rocket cargo test and demonstration at Johnston Atoll. The purpose is “to evaluate the impacts of construction and operation of two landing pads at Johnston Atoll for up to 10 reentry vehicle landings per year over four consecutive years to support the test, demonstration, and evaluation of capabilities under the DAF Rocket Cargo Vanguard program.” The Draft EA and Draft Finding of No Significant Impact (FONSI) was made available for public review in April 2025.

Johnston Atoll is part of the Pacific Remote Islands Marine National Monument. The largest known nesting populations of Red-tailed Tropicbirds (*Phaethon rubricauda*), along with 14 other seabird species, call the atoll home.

Northwest Forest Plan

The Forest Service is amending the [Northwest Forest Plan](#). Old-growth and mature forests in the Pacific Northwest are essential to the recovery of the threatened Northern Spotted Owl (*Strix occidentalis caurina*) and the Marbled Murrelet (*Brachyramphus marmoratus*). The preferred alternatives would increase logging of mature forests and impact the habitat these species depend on. Public comments on the plan amendment were due on March 17, 2025.

Executive Order: “Unleashing Alaska's Extraordinary Resource Potential”

This is a comprehensive [Executive Order](#) (EO) that directs developing Alaska's natural resources to the fullest extent possible. Some of the projects mentioned in the EO could impact habitat in the Arctic National Wildlife Refuge (ANWR), Izembek National Wildlife Refuge, and Tongass National Forest, among other areas.

These places support diverse bird life such as the 200 bird species that have been identified in the ANWR. Nearly the entire Pacific Brant (*Branta bernicla*) population feeds and rests at the Izembek Lagoon with the refuge. Marbled Murrelet, Arctic Terns

(*Sterna paradisaea*), and Golden-crowned Kinglets (*Regulus satrapa*) are among the species that call the Tongass National Forest home.

Seabirds in a changing Arctic – two reviews and a case study

Submitted by: Kathy Kuletz, retired affiliate, U.S. Fish and Wildlife Service, Alaska Region

Seabirds and other upper trophic level (UTL) animals, like fishes and marine mammals, are impacted by climate change throughout the circumpolar Arctic via changes to their habitats and prey. Species affected include perennial residents, breeding-season residents, and non-breeding migrants that use high-latitude oceans at some point in their annual cycle. To consolidate what is known about the impacts of climate change in Arctic ecosystems, two Arctic Council Working Groups - AMAP (Arctic Monitoring and Assessment Program) and CAFF (Conservation of Arctic Flora and Fauna) - invited international teams to conduct reviews as part of a special issue ([Frontiers | Climate Change Impacts on Arctic Ecosystems and Associated Climate Feedbacks](#)). In Kuletz et al. (2024a) we reviewed evidence for changes in migratory patterns of UTLs, while Pecuchet et al. (2025) focused on the characteristics and ecosystem impacts of marine heatwaves; these are summarized below.

In northern latitudes, the extent and timing of sea ice are key drivers of animal migratory movements. Warming temperatures, amplified in Arctic regions, has led to reduced ice coverage, longer open-water seasons, and stronger winds, all of which encourage earlier spring production and open-ocean plankton blooms in late summer. The altered seascape drives changes in prey species and prey distributions. For migratory animals (e.g., most UTLs), suitable habitat and prey access is created for some species, while made more limiting for others. Across taxa, a common thread is a shift in the timing and distribution of animals. Published literature and Indigenous Knowledge both indicate that in most cases marine animals, including seabirds, are moving farther north, sometimes shifting longitudinally, and their migrations occur over longer seasonal time frames. For breeding species, a spring miss-match with prey can mean failed reproduction. For long-distance migrants, such as shearwaters and other Procellariids that head north during their non-breeding season, the miss-match can lead to large-scale mortality events or delayed impacts at their southern hemisphere colonies. In all cases, seabirds must iteratively adjust their timing or routing to match the shifts in marine productivity and prey availability.

Overlaid on long-term warming, Arctic and Subarctic regions are predicted to have more frequent marine heatwaves (MHWs). Largely due to accelerated warming and sea-ice loss, high-latitude MHWs appear to have different initiating mechanisms and consequences, compared to those at lower latitudes. The review found that impacts from MHWs were extensive and evident across widely divergent taxa, with greatest impacts in seasonal sea ice zones, where sea ice retreat is most dramatic. Most Arctic species have narrow thermal preferences and are unlikely to find cold climate refugia, and are therefore most vulnerable to MHWs. In contrast, boreal species may benefit from Arctic and Subarctic MHWs, with the warmer

conditions facilitating expansion of distributional ranges. Currently, the most documented MHWs for high latitudes occurred in the Bering Sea and Chukchi Sea in 2017–2019. There, the series of MHWs had repercussions across the ecosystem, with shifts in community compositions and multiple food-web interactions.

The Pacific Arctic and Subarctic has experienced multiple MHWs since 2015, but has also been warming for decades, which can make it hard to evaluate ecosystem response and resilience to specific MHW events. The responses of UTL taxa, including seabirds, can be species-specific and range from immediate (physiological limitations, reproductive failures) to intermediate or delayed (large die-offs, redistributions at sea) to long-term (altered migratory patterns and population size).

One approach to examining the impacts of MHWs or different temperature stanzas is to compare two different time periods. This is what we did as part of two Arctic ecosystem research programs in the Chukchi Sea (Kuletz et al. 2024b). We collaborated with multiple investigators sharing the same vessel platforms to examine seabird response (distribution and abundance) to changes in environmental conditions and prey during a relatively cool period (2012, 2013) and one with multiple MHWs (2017, 2019). We modeled at-sea seabird densities for five foraging guilds with respect to multiple oceanographic, prey, and geographic variables.

The warmer years of our study were characterized by warmer, saltier waters as more Bering Sea water flowed northward through the Bering Strait. Compared to the cooler years, abundances of large copepod species and euphausiids were very low, but fish abundance increased dramatically. In particular, age-0 walleye pollock *Gadus chalcogrammus* inundated the Chukchi Sea. These ecosystem changes ultimately affected seabirds. Species richness of seabirds was elevated during the warm period, but with lower species diversity, largely due to the influx of short-tailed shearwaters *Ardenna tenuirostris*. As expected, seabird foraging groups showed different responses to oceanographic and prey variables, but within-taxa, relationships often differed between cool and warm periods, perhaps evidence of adaptive responses. However, these adjustments while foraging at sea were not entirely successful, based on findings by others of colony failures and die-offs.

Based on results of this and other studies, we proposed a conceptual model (Fig. 1) that we hope will facilitate exploration of the mechanisms affecting seabirds in Pacific Arctic ecosystems. The model outlines how MHWs affected the offshore seabird community of the Chukchi Sea, primarily via changes in prey species composition and distribution. There was also the potential for direct competition for prey, such as unprecedented increases in the biomass of juvenile cods (Gadidae) that consume the same prey used by planktivorous seabirds.

Ongoing ecosystem alterations challenge the resilience of individual seabirds and entire populations. They also challenge researchers and resource managers. Seabirds have played an important part in telling the story of climate change impacts to Arctic and Subarctic marine ecosystems. The publications summarized in these papers highlight the multitude of

approaches needed and varied aspects of seabird ecology that can be used to provide some answers.

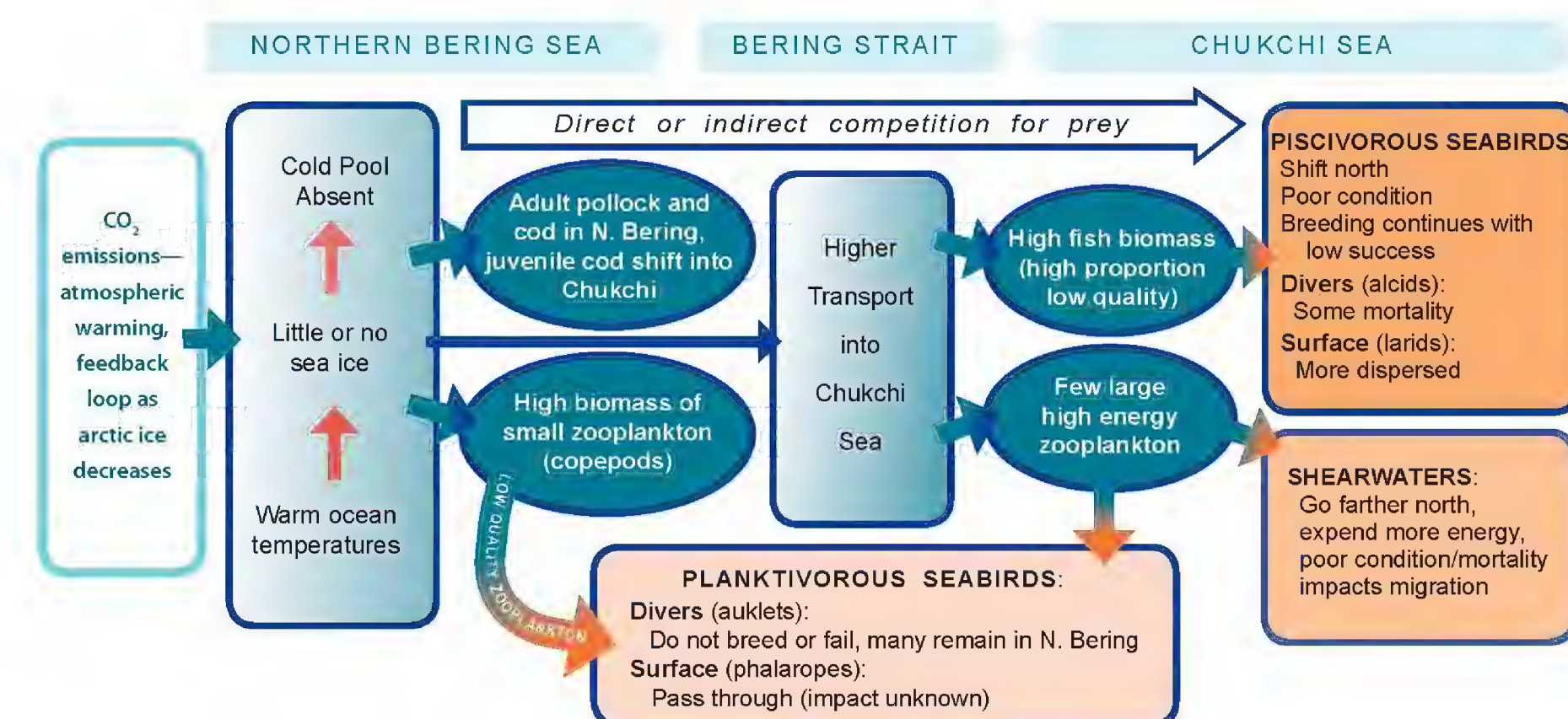


Figure 1. *Reprinted from Kuletz et al. 2024b.* A conceptual model illustrating the physical drivers and biological components of the Chukchi Sea ecosystem that can affect seabirds during marine heatwave years. During 2017–2019, conditions in the Bering Sea (left side) led to lack of a thermal barrier for juvenile pelagic fish and increased the transport of heat, nutrients, zooplankton, and fish through Bering Strait (center) into the Chukchi Sea (right side). Planktivorous seabirds (breed in the Bering Sea and Bering Strait) can be directly affected by lack of large zooplankton, and their post-breeding migration to the Chukchi curtailed. Piscivorous seabirds (breed in Bering and Chukchi regions) can be directly and indirectly affected via competition with pelagic fish, but surface foragers can search farther for prey. Shearwaters (non-breeding migrants) can be impacted by lack of sufficient, high-lipid prey and perhaps, by the energetic cost of traveling farther north in search of prey.

Citations

Kuletz KJ, Ferguson SH, Frederiksen M, Gallagher CP, Hauser DDW, Hop H, Kovacs KM, Lydersen C, Mosbech A and Seitz AC (2024a) A review of climate change impacts on migration patterns of marine vertebrates in Arctic and Subarctic ecosystems. *Front. Environ. Sci.* 2:1434549. doi:10.3389/fenvs.2024.1434549

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Subarctic marine heatwaves and their ecological impacts. Front. Environ. Sci. 13:1473890. doi: 10.3389/fenvs.2025.1473890

Birds with Fish: Studying the diets of Oregon's coastal birds alongside community scientists

Submitted by: William L Kennerley and Rachael A Orben, Department of Fisheries, Wildlife, and Conservation Sciences, Oregon State University, Hatfield Marine Science Center, Newport, Oregon

Bill-load photography can be an effective means of diet sampling for a number of seabird species (1). Many alcid and terns, for instance, carry prey back to the nest site in their bills, allowing researchers to not only identify the prey species represented, but also count and estimate the size of prey item(s). Even outside of the breeding period, this technique can allow snapshot glimpses into what birds are consuming for self-provisioning.

While bill-load photography does have distinct limitations, as with all means of diet assessment (2), photography-based studies of certain species have revealed similar diet compositions as through the use of molecular methods (3, 4). What's more, photography can be much cheaper than using fecal DNA or stable isotopes, and very little training is required to collect photographic records. Several recent studies have used crowd-sourced photographs of feeding birds to study seabird diets with great success (5, 6). Beyond being an inexpensive means of collecting great quantities of data, community/citizen science (when done right) can be an effective way of collecting valuable information while simultaneously educating and fostering relationships with the curious public (7).

For these reasons, Oregon State University (OSU) graduate certificate student Noah Dolinajec helped launch the *Birds with Fish* community science initiative in 2021. Through the help of local conservation organizations and Bird Alliance (formerly Audubon) chapters, *Birds with Fish* began to garner local support. Using a simple, online submission form (<https://blogs.oregonstate.edu/coastaloregonbirds/>), community scientists can easily share their photographs — plus a few accompanying pieces of metadata — with our research team in OSU's Seabird Oceanography Lab.



In many ways, bill-load photography is an ideal way for us to involve community members in scientific research. The Oregon Coast draws large numbers of birders and nature photographers, many of whom already take the kinds of photographs we're seeking. It's also a low-commitment kind of community science that's available to people from diverse socioeconomic backgrounds; there are no regular time commitments, and while photographing some species, like Tufted Puffins (*Fratercula cirrhata*), requires an expensive camera with hefty zoom lens, others, like guillemots and cormorants, may be photographed from harbors and jetties with inexpensive equipment, sometimes just by digi-binning! If conditions are right, large numbers of photographs may be collected with ease, often without much physical effort. Our research team handles all the bird and prey identification and stores the photographic records, allowing us to easily proof our data and ensure data quality remains high; this is an advantage over checking the identity of many suspicious eBird records.

As *Birds with Fish* nears its fourth year, our project is nearing 400 submissions, representing at least 31 prey types (fish and marine invertebrates) being consumed by 32 species of marine and estuarine birds. Now, thanks in part to a two-year grant from the Oregon Conservation and Recreation Fund, we are able to devote more time and resources to the project. We're hopeful that more chances to share and talk about our program with the nature-curious public will help us collect more valuable information on the diets of Oregon's coastal birds, and will be a vehicle through which we can share information about the many threats that these birds face. Please help us spread the word about *Birds with Fish* and our efforts to work with community scientists as we seek to learn more about the diets of Oregon's coastal birds.



Figure 1. One of the photos submitted to Birds with Fish – a pigeon guillemot (*Cepphus columba*) feeding on a Pacific Sandlance (*Ammodytes personatus*) in Alsea Bay, Oregon. Photograph by Roy Lowe.

1. Gaglio, D., Cook, T. R., Connan, M., Ryan, P. G. & Sherley, R. B. Dietary studies in birds: testing a non-invasive method using digital photography in seabirds. *Methods Ecol Evol* 8, 214–222 (2017).
2. Barrett, R. T. et al. Diet studies of seabirds: a review and recommendations. *ICES Journal of Marine Science* 64, 1675–1691 (2007).
3. Kennerley, W. L., Clucas, G. V. & Lyons, D. E. Multiple methods of diet assessment reveal differences in Atlantic puffin diet between ages, breeding stages, and years. *Front Mar Sci* 11, (2024).
4. Clucas, G. V, Stillman, A. & Craig, E. C. From presence/absence to reliable prey proportions: A field test of dietary DNA for characterizing seabird diets. *bioRxiv* 2024.03.22.586275 (2024) doi:10.1101/2024.03.22.586275.
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6. Owen, E. et al. Spatial and within-season variation in the diet of a declining seabird described through digital photography and citizen science. *Avian Conservation and Ecology* 19, (2024).
7. Fraisl, D. et al. Citizen science in environmental and ecological sciences. *Nature Reviews Methods Primers* 2, (2022).

The impact of feral honey bees on endangered seabirds in the Hawaiian Islands

Submitted by: Andre Raine, Archipelago Research and Conservation

The 'a'o (Newell's shearwater *Puffinus newellii*) and 'ua'u (Hawaiian petrel *Pterodroma sandwichensis*) are both endangered seabirds endemic to the Hawaiian Archipelago. The impact of introduced predators (such as cats, rats, pigs and barn owls) on these species is well known and is a major conservation issue. Due to this, there are now seven management sites focused on protecting these species on the island of Kauai, where ongoing predator control operations have successfully decreased predation rates and increased reproductive success rates over time. However, in recent years a new threat has emerged - feral honey bees (*Apis mellifera*, bee) - which were deliberately introduced to the Hawaiian Islands starting in 1857 for bee-keeping.



The impact of bees on seabirds has not been previously documented, although it has been noted in the congeneric Bermuda petrel (*Pterodroma cahow*) that in rare instances burrows can be occupied by bees. In our paper, published in volume 17(2) of the journal Human-Wildlife

Interactions, we highlight the impact of feral honey bees on endangered seabirds by documenting records of bee invasions at burrows within our management sites as well as additional records from the island of Lānaʻi. Between 2011 and 2021, 17 bee swarms were recorded at seabird burrows on both islands combined (13 on Kauaʻi and 4 on Lānaʻi), consisting of 14 ʻuaʻu burrows and 3 ʻaʻo burrows. Bee swarms at burrows were concentrated in the summer months, and none occurred during the winter. This overlaps with the bee swarming season in Hawaiʻi which, due to its tropical weather, is more extended than the mainland.

Ten (58.8%) of these incidents resulted in the bees taking over the burrow and building a hive inside. Of the 10 takeovers, all resulted in a failed breeding season in that year and six resulted in a seabird mortality (including two instances where both adults of a breeding pair were killed). The likelihood of a seabird mortality during a burrow takeover event was related to the time of year when the takeover occurred. Takeovers occurring before incubation (which on Kauaʻi occurs in June/July) appeared to be less prone to mortality, as attending adults presumably retreat upon entering a burrow that has been taken over by bees. On the other hand, adults that are incubating are more likely to get trapped inside the burrow and stung to death by bee swarms – particularly when considering that a single bee colony can consist of 18,000-20,000 worker bees. Burrow takeovers occurring later in the season will almost certainly result in the death of the chicks, which have nowhere to go once the bees build their hives inside their burrows. Breeding was also less likely to be initiated in the following year after a burrow takeover, often because an adult or adults were killed during the event. Furthermore, in one case the burrow chamber was too deep to remove the bee hive, which had been built in the back of the chamber itself. The decision was made by project managers to seal the burrow off to prevent the returning adult from getting covered in honey, which had coated the burrow chamber. This represents an additional factor to be aware of, because even if a hive is abandoned, it can still have serious consequences to returning birds.



Removing bees from active burrows should be considered a seabird conservation priority – this is also true for ensuring the safety of staff operating within the seabird colonies (particularly those prone to anaphylaxis). A method successfully used on Kaua‘i (and developed by Hallux Ecosystem Restoration LLC, Lihue, Kaua‘i) is a “bee vacuum” which consists of a battery-powered shop vac and an in-line insect collection container with removable mesh inserts that can be swapped out mid-removal to make room for more bees. Staff in protective bee suits first use a bee-smoker to smoke the burrow, which calms the bees and brings the majority of the bees back to the hive and onto the combs. The bees and comb are then vacuumed out of the burrow and into the collection container where they can then be humanely disposed of. While the bee vacuum is an important management tool, it is a reactive technique that can only be used once a burrow has been taken over and doesn’t prevent a failed breeding season (or mortalities). Therefore, proactive techniques should also be considered. One that is currently now being used on Kaua‘i is the use of bee swarm pheromone traps at strategic locations within management areas.

Both the ‘a‘o and ‘ua‘u face a wide range of threats throughout the Hawaiian Islands, with the result that populations have declined dramatically on islands such as Kaua‘i in recent decades. While the conservation impact of bees to seabirds is currently minimal compared to threats such as power line collisions and introduced mammalian predators, the fact that it leads to nest abandonment and even the death of breeding adults or chicks is a cause for concern. If climate change results in an increase in these incidents, they could rapidly become a serious threat to the survival of these two species, as bee colony densities can be as high as 100 nests per km².

To read the full paper, please visit the following link: [The Impact of Feral Honey Bees on Endangered Seabirds in the Hawaiian Islands](#).

2024-2025 Regional reports

Alaska & Russia

Author(s): Brie Drummond (USFWS Alaska Maritime NWR), Arthur Kettle (USFWS Alaska Maritime NWR), Heather Renner (USFWS Alaska Maritime NWR), Nora Rojek (USFWS Alaska Maritime NWR), Matt Rustand (USFWS Alaska Maritime NWR), Ray Buchheit (USFWS Alaska Maritime NWR)

Aleutian Islands:

Annual seabird monitoring at Aikta (eastern Aleutians) and Buldir (western Aleutians) islands was led by Nora Rojek (U.S. Fish and Wildlife Service (USFWS), Alaska Maritime National Wildlife Refuge (AMNWR)) with summer-long field crews consisting of Shiho Koike, Ross Bullington, and Nick Minnich on Buldir, and Erin Parsons and Molly Henling on Aikta. At Buldir Island, the crew collected productivity, diet, and population data on a variety of species including Common and Thick-billed Murres (*Uria aalge* and *U. lomvia*); Parakeet (*Aethia psittacula*), Least (*A. pusilla*), Whiskered (*A. pygmaea*), and Crested (*A. cristatella*) auklets; Horned and Tufted Puffins (*Fratercula corniculata* and *F. cirrhata*); Black-legged and Red-legged Kittiwakes (*Rissa tridactyla* and *R. brevirostris*); and Fork-tailed and Leach's storm-petrels (*Hydrobates furcatus* and *H. leucorhous*). At Aikta Island, the crew monitored Black Oystercatchers (*Haematopus bachmani*), Common and Thick-billed Murres (*Uria aalge* and *U. lomvia*); Ancient Murrelets (*Synthliboramphus antiquus*); Horned and Tufted Puffins (*Fratercula corniculata* and *F. cirrhata*); Glaucous-winged Gull (*Larus glaucescens*); Fork-tailed and Leach's storm-petrels (*Hydrobates furcatus* and *H. leucorhous*); and Double-crested, Red-faced, and Pelagic Cormorants (*Phalacrocorax pelagicus*, *P. urile*, and *P. auritus*).

In June, Heather Renner, Megan Boldenow, and Erik Andersen (USFWS AMNWR, Ecological Services (ES), and Marine Mammals Management (MMM)) conducted surveys for Aleutian tern (*Onychoprion aleuticus*) along the Bering side of the Alaska Peninsula. Surveys occurred from Port Moller to Unimak Island, supported by the R/V *Tigla*.

In July, Stacey Buckelew, Kim Holzer, Ben Wishnek (USFWS, Invasive Species Program), Lauren Flynn, Ray Buchheit, Adrienne McGill (USFWS AMNWR), Michael Jennings, Katie Kromback, Erica Wells (U.S. Department of Agriculture, Animal and Plant Health Inspection Service (USDA APHIS) Wildlife Services) and Vera Brosgol (Voices of the Wilderness Artist in Residence) conducted Norway rat pre-eradication baseline studies and biological monitoring on Great Sitkin Island in the central Aleutians, supported by the R/V *Tigla*.

Alaska Peninsula:

Annual seabird monitoring at Chowiet Island (Semidi Islands group) was led by Brie Drummond (USFWS AMNWR), with a summer-long field crew of Joelle Marchiani and Aurora Kuczek. They collected productivity, diet, and population data on a variety of species including Common and Thick-billed Murres (*Uria aalge* and *U. lomvia*), Parakeet and Rhinoceros Auklets (**Aethia psittacula* *and *Cerorhinca monocerata*), Horned and Tufted Puffins (**Fratercula corniculata* *and *F. cirrhata*), Black-legged Kittiwake (*Rissa tridactyla*), Glaucous-winged Gull (*Larus glaucescens*), and Northern Fulmar (*Fulmarus glacialis*).

Gulf of Alaska:

Annual seabird monitoring for the Alaska Maritime National Wildlife Refuge at St. Lazaria Island in southeast Alaska was led by Brie Drummond (USFWS AMNWR) with a summer-long crew of Jennifer Lewis and Ayla Liss. They collected productivity, population, and diet data on Common and Thick-billed Murres (*Uria aalge* and *U. lomvia*), Rhinoceros Auklets (*Cerorhinca monocerata*), Tufted Puffins (*Fratercula cirrhata*), Black Oystercatchers (*Haematopus bachmani*), Glaucous-winged Gulls (*Larus glaucescens*), Fork-tailed and Leach's Storm-petrels (**Hydrobates furcatus* *and *H. leucorhus*), and Pelagic Cormorants (*Urile pelagicus*). Brie Drummond and Ashley Lutto also deployed geolocators on Fork-tailed and Leach's Storm-petrels on St. Lazaria.

At East Amatuli Island, Arthur Kettle (USFWS AMNWR) and crew installed time-lapse cameras for season-long monitoring of Common Murres (*Uria aalge*), Tufted Puffins (*Fratercula cirrhata*), and Black-legged Kittiwakes (*Rissa tridactyla*). In August Arthur, Karyn Murphy, and Zoe Strothkamp surveyed monitoring plots of Fork-tailed Storm-petrels (*Hydrobates furcatus*); Brie Drummond and Matt Rustand deployed light-level geolocators on Fork-tailed Storm-petrels. The crew also sampled petrel chick diet. Arthur Kettle and Ayla Liss (USFWS AMNWR) retrieved the time-lapse cameras in late September.

Bering and Chukchi Seas:

Annual seabird monitoring in the Pribilof Islands at St. Paul and St. George was led by Matt Rustand (USFWS AMNWR) with summer-long field crews consisting of Nathan Dubrow and Sam Darmstadt on St. Paul, and Frank Mayer, Joe Cleaves, and Danielle Donadio on St. George. Both crews collected data on a variety of species including Common Murres (*Uria aalge*), Thick-billed Murres (*Uria lomvia*), Least Auklets (*Aethia pusilla*), Black-legged Kittiwakes (*Rissa tridactyla*), Red-legged Kittiwakes (*Rissa brevirostris*), and Red-faced Cormorants (*Phalacrocorax urile*). The crews collected productivity, diet, adult survival and population data. On St. George, geolocators were deployed on thick-billed murres in a collaborative effort with University Alaska, Fairbanks.

At Cape Lisburne, Arthur Kettle and Ray Buchheit (USFWS AMNWR) installed time-lapse cameras in June for monitoring breeding success of Common and Thick-Billed Murres (*Uria aalge* and *U. lomvia*) and Black-legged Kittiwakes (*Rissa tridactyla*). The cameras were retrieved in October by Arthur Kettle and Matt Rustand.

Author(s): Anne Schaefer

In 2024, Anne Schaefer, Mary Anne Bishop, and Sarah Hoepfner (Prince William Sound Science Center) conducted at-sea marine bird surveys in Prince William Sound, Alaska to document density and distribution patterns in and around the oil-tanker escort lane during the non-breeding season. Schaefer also led at-sea marine bird surveys in eastern Prince William Sound to examine marine bird density and distribution relative to mariculture (seaweed and oyster) development. These surveys are a component of a larger collaborative research and monitoring program studying the impact of mariculture farms on the environment and identifying environmental drivers of farm productivity. Additionally, Schaefer assisted a working group within the PSG Aleutian Tern Technical Committee with the coordination and implementation of a statewide Aleutian tern survey in Alaska. This was the second year of a multi-year effort. The 2024 study areas included the Cook Inlet region and the Alaska Peninsula/Bristol Bay region.

Author(s): Shannon Whelan

The 2024 field season on Middleton Island marked the 30th year of tower-based research and monitoring. Scott Hatch (Institute for Seabird Research and Conservation (ISRC)), Éliane Miranda (McGill University), Paul Solmon (Université Bourgogne), Marie Desbois (Quebec), Emmylou Kidder (Virginia), and Shannon Whelan (ISRC) opened the field station in early April. The core research team, consisting of camp leader Katelyn Depot (McGill), ISRC volunteers and university students Helen Li (Washington), Juliette Malaniak (Michigan), Isaac Fournier (Tennessee), Chinatsu Nakajima (Nagoya University), Jumpei Okado (Nagoya), Abby Eaton (McMaster University), and Cassandra Ciafro (McGill) stayed from early May until mid-August. Flynn O'Dacre (McMaster) and Maria Pisciotta (Bucknell University) supported the team for much of the summer. Shannon Leone Fowler (University of Roehampton) and Emily Choy (McMaster) deployed heart rate loggers, and were accompanied by Dan Costa (University of Santa Cruz), Laurie Allen-Requa (Peralta), and Griffin, Brennan and Devon Dolder (United Kingdom). Kyle Elliott (McGill) and Morgan Benowitz-Fredericks (Bucknell) joined to support student work mid-season, and Martha Hatch (ISRC) assisted in closing the field station. A wide breadth of movement, physiology, behaviour, contaminant, and diet studies were completed for several species. With respect to long-term monitoring, Black-Legged Kittiwakes (*Rissa tridactyla*), Rhinoceros Auklets (*Cerorhinca monocerata*), and Pelagic Cormorants (*Urile pelagicus*) showed near-average breeding success, while Tufted Puffins (*Fratercula cirrhata*) had high breeding success. In seabird diets, the Middleton team observed a continuation of the muted return of Capelin (*Mallotus villosus*), which dropped out of the diets during the 2014-2017 North Pacific marine heatwave.

Antarctica

Author(s): Rachael Orben, Suzanne Winquist

In 2024, The Seabird Oceanography Lab (Suzanne Winkler), in collaboration with Dr. Katie Dugger and Point Blue Conservation Science, conducted monitoring and biologging device deployments at the Cape Royds and Cape Crozier Adélie Penguin (*Pygoscelis adeliae*) colonies in the Ross Sea, Antarctica. Multiple years of data from video loggers and depth/acceleration devices deployed on breeding Adélie Penguins are being used to investigate the foraging behavior and energetics of chick-provisioning adults, particularly in relation to fine-scale sea ice conditions. This project is funded by the National Science Foundation (NSF) Office of Polar Programs (OPP), award number 1543498.

Asia & Oceania

Author(s): Rachael Orben, Jane Dolliver, Risa Dickson, Jennifer Spegon, Kristopher Pacheco

The Seabird Oceanography Lab, in collaboration with the U.S. Fish and Wildlife Service (USFWS) is using high-resolution satellite images to count short-tailed albatross colonies with the goal of providing a population estimate of the Senkaku Island colony. Successful collections of imagery of the island group occurred in December 2023 and December 2024. Images have undergone post-collection processing and two-observer counts. This project is funded by the USFWS Alaska Region Ecological Services.

Author(s): Yasuko Suzuki (BirdLife International), Motohiro Ito (Toyo University), Nobuhiko Sato (Fisheries Research and Education Agency)

Yasuko Suzuki (BirdLife International), Motohiro Ito (Toyo University) and his students, and Nobuhiko Sato (in an advisory role, Fisheries Research and Education Agency) continued an experimental study on a gillnet bycatch mitigation technique in collaboration with Tokyo Sea Life Park in Japan. The experiment was conducted in an aviary located at an aquarium with a dive pool containing populations of Common Murres (*Uria aalge*) and Tufted Puffins (*Fratercula cirrhata*). The goal of the study was to compare their behavior to different colors of gillnet mimic, designed so that bird safety was ensured. Preliminary results revealed subtle increase in avoidance behavior against some colors. However, it was only observed when the experiment was carried out with chumming of feed. Such avoidance behavior was not evident regardless of color when live bait fish was used, which suggests stronger stimuli is necessary to reduce gillnet bycatch at sea.

We also continued a systematic data collection project in Japan with local gillnet fishers in NW Hokkaido, including Teuri Island, a breeding site of four alcids and two cormorant species (four of them are listed in Japan's Red Data Book). The project aimed to evaluate environmental and operational factors for seabird bycatch in gillnet fisheries. Although the number of bycaught birds reported was small during the project period, water depth where gillnets were set appeared to be an important factor. We are currently in discussion with local stakeholders to shift towards a more sustainable model for long-term systematic data collection.

Author(s): Yat-tung Yu and John C.T. Chung

Yat-tung Yu and John C.T. Chung, with the team of the Hong Kong Bird Watching Society, has continued banding Bridled Terns (*Onychoprion anaethetus*) in Hong Kong for eight consecutive years as of 2024. In summer 2024, a total of 63 Bridled Tern adults (6 individuals) and chicks (57 individuals) were caught and banded. Three adults were also fitted with the GPS trackers for studying their home ranges throughout the breeding season. All these terns, except five, were also fitted with engraved colour flags for population demography study. This colour-marked and tracking study of breeding Bridled Terns will be continued in the summer of 2025.

Author(s): Steffen Oppel

The Royal Society for the Protection of Birds (RSPB), Auckland Zoo, and Manaaki Whenua (Landcare Research, New Zealand) conducted an expedition to Henderson Island in June and July 2024 to explore options for the eradication of invasive rats (kiore, *Rattus exulans*), which have decimated seabird populations (Murphy's Petrel *Pterodroma ultima*, Henderson Petrel *P. atrata*, Herald Petrel *P. heraldica*, and Kermadec Petrel *P. neglecta*) on the island. A previous rat eradication attempt in 2011 had failed, and the team conducted trials with different baits to understand which baits rats may prefer. No seabird work was conducted during this expedition. Plans to eradicate invasive rats from Henderson are being discussed with the community on Pitcairn.

Author(s): Fransisca Noni Tirtaningtyas (Coordinator Burung Laut Indonesia) and Aronika Kaban

This activity was funded by 2024 Small Grant Fund for Working Groups and Task Forces East Asia Australasia Flyway Partnership (EAAFP) with the title "Monitoring the Christmas Frigatebird in Jakarta Bay August 2023 -- August 2024." This report is already sent to the EAAFP Secretariat. Our collaboration activity between Burung Laut Indonesia and the Conservation of Natural Resources (BKSDA) Jakarta

Our background study:

This activity is a monitoring activity for one of the bird species included in the IUCN Red List of Threatened Species and the Single Species Action Plan, namely the Christmas Frigatebird (*Fregata andrewsi*). By conducting this activity, it was found that this site is included in the Flyway Site Network, which supports more than 1% of individuals in a population of a species or subspecies of migratory waterbirds, which supports the population of the Christmas Frigatebird (0.083-2.333%). In July 2012, monitoring found more than 200 individuals in a single day of observation (almost 10% of the population). Jakarta Bay also supports two vulnerable bird

species found during the survey, such as Christmas Island Frigatebird and Aleutian Tern, one species is Near Threatened: Swinhoe's Storm-Petrel, and 14 species protected by the Indonesian government. Jakarta Bay as a staging area because it supports the Christmas Island Frigatebird for at least ~0.083-1.12% population.

Our project objectives such as:

1. Monitoring the population numbers of Christmas Frigatebird in Jakarta Bay
2. Monitoring the threats in Christmas Frigatebird in Jakarta Bay
3. Build the habitat and species management capacity with the local government
4. Capacity building for the local people around Jakarta Bay

Our results:

Our monitoring of the population numbers from Christmas Frigatebird during activity between August 2023 and August 2024 showed that all the sex and age stages used the Jakarta Bay for foraging and roosting (Fig 1) with the highest numbers of individual seen in August (56), October (41) and July (47), respectively (Fig 2).

During our monitoring to the Christmas Frigatebird, we counted for several seabird species. In totally, there were 16 seabird species in Jakarta Bay, such as Christmas Frigatebird, Lesser Frigatebird, Great Frigatebird (Fregatidae), Little-black Cormorant (Phalacrocoracidae), Parasitic Jaeger (Stercorariidae), Swinhoe's Storm-Petrel (Hydrobatidae). And there were 10 species from Laridae, namely Aleutian Tern, Lesser Crested Tern, Common Tern, Roseate Tern, Great Crested Tern, Little Tern, Whiskered Tern, White-winged Tern, Black-naped Tern, and Bridled Tern.

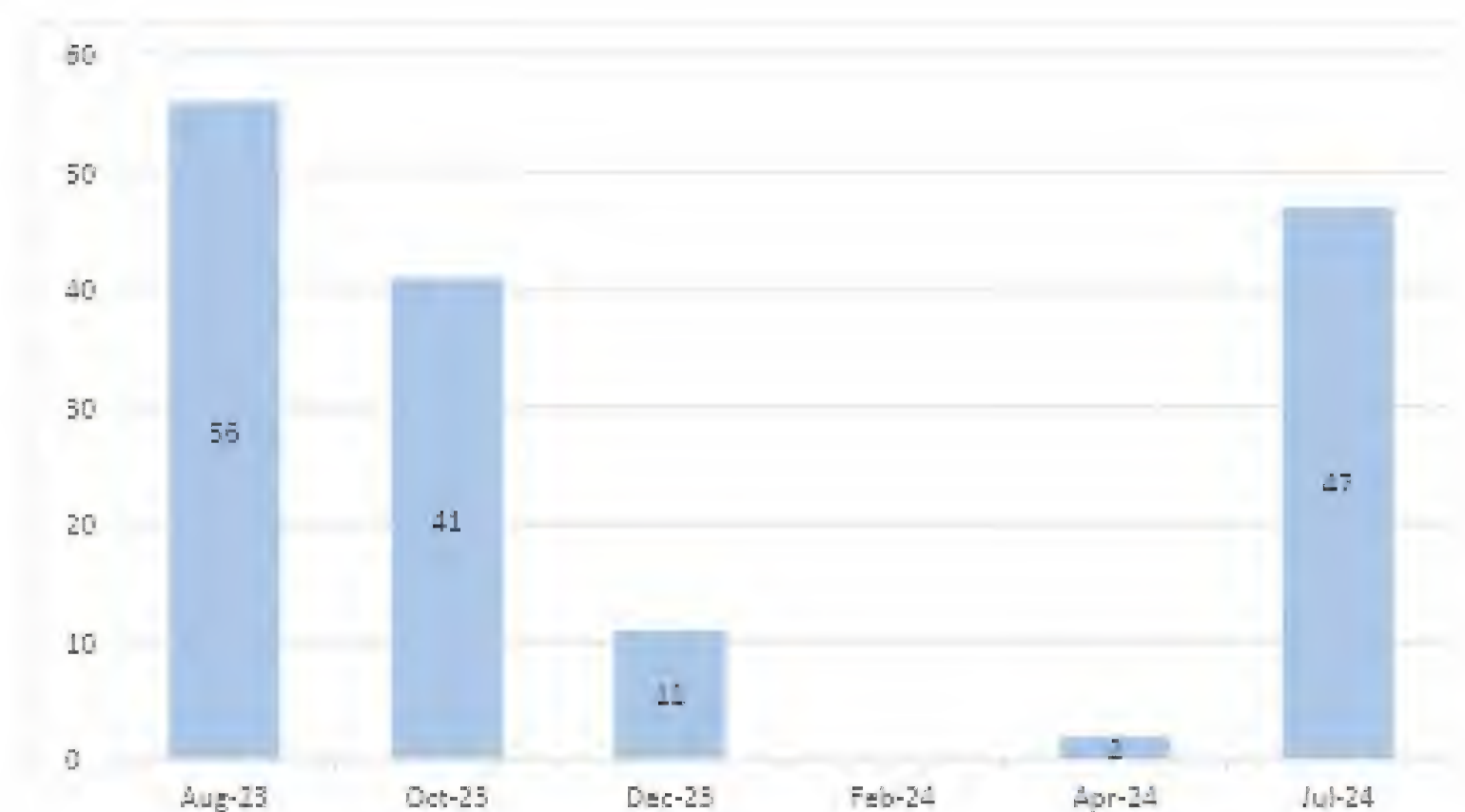


Figure 1. The number of Christmas Frigatebirds during the activity. It can be seen that August 2023 had the highest number. In February 2024 there was no bird during activity.

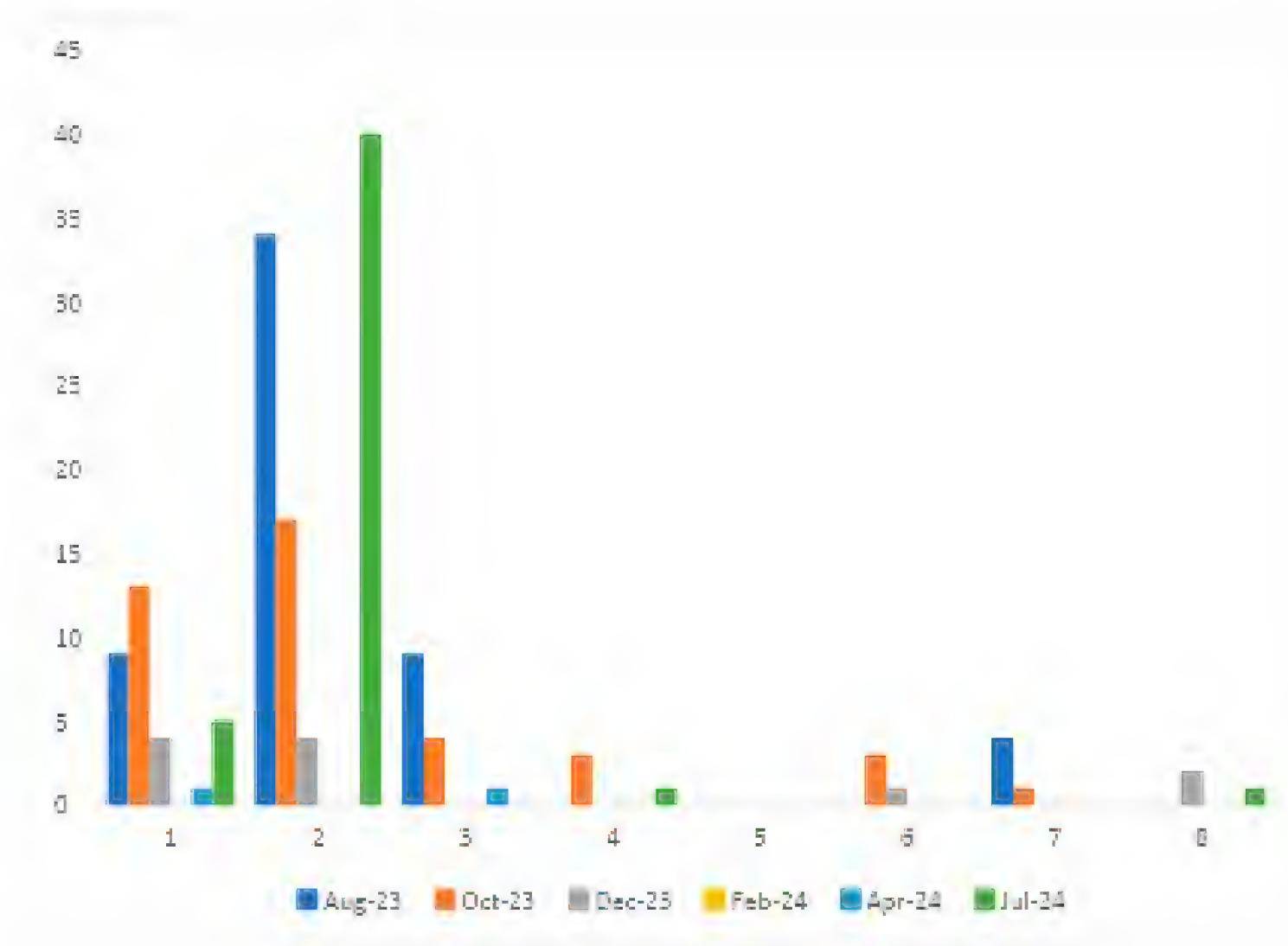


Figure 2. Age and sex composition encountered during the activity. In August and October, the age and sex composition were almost complete compared to other months.

The information obtained from the fishermen during the interviews showed that there were three cases of cormorants and frigatebirds being accidentally caught in fishing gear. Specifically, a frigatebird was entangled in a fishing net and two cormorants were entangled in a Danish seine net. Furthermore, during the monitoring activities conducted in July and August of 2024, the team observed two adult males of the Christmas Frigatebird that had become entangled in fishing gear on their wings (Fig. 3).



Figure 3. Two individuals of Christmas Frigatebird were captured in fishing line (blue circle) on July and August 2024. ©FN Tirtaningtyas (left) & Aronika Kaban (right).

We collated this information and discussed it with relevant stakeholders and fishermen around Jakarta Bay. The discussion was attended by 43 participants from the following local governments: Conservation of Natural Resources - Jakarta, the Ministry of Marine Affairs and Fisheries (KKP) (online), the Food Security, Marine and Agricultural Agency (DKPKP) of DKI Jakarta Province, the Indonesian Navy (TNI AL) Tanjung Pasir, the National Partnership for Migratory Bird and Habitat Conservation (KNKBBH) and a group of fishermen (Fig 4).

Furthermore, we are committed to capacity building for local youth in the nearby Christmas Frigatebird roosting area. We successfully engaged at least 135 children in birdwatching and watching the documentary film activities. We also disseminated awareness campaign tools to children, with the aim of raising their awareness of seabirds in Jakarta Bay (Fig 5).



Figure 4. Group photo with the local government and the fishermen © Boas Emmanuel; Figure 5. Poster for the children about the seabirds in Jakarta Bay with the local name.

Canada

Author(s): Rian Dickson and others (Laskeek Bay Conservation Society)

The Laskeek Bay Conservation Society (LBCS), based in Skidegate, BC, completed their 35th field season (19 April -- 20 July 2024) of monitoring marine and terrestrial ecology in Laskeek Bay, Haida Gwaii. Rian Dickson and Matthew Peck, assisted by Frédérique Poulin and Amaya Black, coordinated the various research and monitoring projects at the field station on East

Limestone Island, including Pigeon Guillemot (*Cepphus columba*, PIGU) nestbox monitoring by video camera, Glaucous-winged Gull (*Larus glaucescens*, GWGU) colony censuses, Black Oystercatcher (*Haematopus bachmani*, BLOY) surveys, and automated recording unit (ARU) detection of Ancient Murrelet (*Synthliboramphus antiquus*, ANMU), Fork-tailed Storm-petrel (*Hydrobates furcatus*, FTSP), and Cassin's Auklet (*Ptychoramphus aleuticus*, CAAU). Four boat-based transect surveys for seabirds were conducted throughout the season, monitoring trends of at-sea Marbled Murrelets (*Brachyramphus marmoratus*, MAMU) and other seabirds.

Ancient Murrelet chick departures from the East Limestone Island colony were monitored using thermal motion cameras, as has been done since 2019. Fourteen ANMU chicks were captured on camera; while this remains much lower than the historical average, numbers appear to have stabilized rather than continuing to decline. LBCS continues to do ANMU gathering ground counts during May and June every year. Black Oystercatcher surveys were completed in Laskeek Bay in early June and early July.

Many volunteer and student assistants joined the field staff this season, and there were visits from local school and tour groups, who learned about seabird biology, local ecology, and conservation issues. The Laskeek Bay Conservation Society is a non-profit organization, with a volunteer board of directors. Dr. Anthony Gaston serves as the society's Science Director.

Author(s): Mark Hipfner (Environment and Climate Change Canada)

Mark Hipfner (Environment and Climate Change Canada (ECCC), Delta -- Wildlife Research Division) reports that summer 2024 marked the 31st year of operation of the Centre for Wildlife Ecology's (CWE) seabird research program on Triangle Island. Triangle Island supports the largest aggregation of breeding seabirds in the eastern North Pacific Ocean south of Alaska, and British Columbia's most diverse seabird community of 13 breeding species. The 2024 field crew consisted of Hannah Avenant (ECCC, Delta -- Canadian Wildlife Service), Christine Rock (ECCC, Nanaimo -- CWS), Sonya Pastran (ECCC, Victoria -- Wildlife Research Division), Sarah Hudson (ECCC, Delta -- WRD), Nikolas Clyde (ECCC, Delta -- WRD), and Devin de Zwaan (ECCC, Delta -- WRD). The research program in 2024 collected information on diets of nestling Cassin's Auklets (*Ptychoramphus aleuticus*), adding to a long-term dataset for this SAR-listed species, a Climate Change sentinel. Other projects on Triangle Island in 2024 included deploying GPS tags on 10 adult Tufted Puffins (*Fratercula cirrhata*) as part of a multi-year, multi-species program under the Ocean Protection Plan (OPP) to delineate the at-sea distributions of key seabird species, and to assess how effectively the boundaries of the Scott Islands Marine National Wildlife Area envelop key foraging areas for seabirds in the region.

Also under OPP, the Triangle Island field crew deployed 15 GLS tags on Tufted Puffins to delineate at-sea distributions over the annual cycle, in collaboration with PhD student Katelyn Stoner (Oregon State University, Corvallis, OR). GLS tags were retrieved from 2 Tufted Puffins tagged in 2023. The larger project also includes collaboration with US Fish and Wildlife Service

researchers, who are deploying GLS tags on puffins on colonies in the Alaska Maritime National Wildlife Refuge.

Research was also conducted on several major Rhinoceros Auklet (*Cerorhinca monocerata*) colonies in 2024 (Fig. 2). Hannah Hall, Jesse Russell, and Tessa Craig (ECCC, Delta -- WRD), visited Gander Island in the Moore Islands Group off BC's Central Coast; Hipfner, Neena Pradal (ECCC, Delta -- WRD), and Zoe Crysler (ECCC, Delta -- CWS), along with Mary-Lynne Henderson (Gwa'sala-Nakwaxda'xw Nations, Port Hardy) visited Pine Island off the Central Coast; and Hipfner, Pradal and Anneka Vanderpas (ECCC, Delta -- WRD), along with Rhythm Donkersley (Kitsumkalum First Nation, Terrace) visited Lucy Island off BC's North Coast. The main goal of this program, which was started in 2006, is to study effects of oceanographic variation across multiple trophic levels -- the diets fed to nestling auklets and the diets of their major fish prey, the Pacific Sand Lance (*Ammodytes personatus*) and Pacific Herring (*Clupea pallasii*). For this project we collaborate with US federal, state and academic researchers who work on Protection Island, WA, in the Salish Sea (Fig. 2). Field crews also deployed GPS tags on 20 Rhinoceros Auklets on Gander Island and 10 GPS tags on Pine Island, continuing a long-term international research project in support of the OPP (Fig. 3). While on the seabird colonies in 2024 we concurrently also completed the twelfth year of a project investigating the consumption of Pacific salmon (*Oncorhynchus* spp.) by seabirds in BC waters, in collaboration with Strahan Tucker (Fisheries and Oceans Canada (DFO), Nanaimo -- Pacific Biological Station); and completed the 16th year of a project investigating the distribution and abundance of microplastics in northeastern Pacific Ocean food webs, in collaboration with Moira Galbraith (DFO, Sidney - Institute of Ocean Sciences).

There was also winter field work completed in early January to early March of 2024. Craig, Hall, Hipfner, Hudson, Pastran, Pradal, Vanderpas, along with Katie Chettle and Guy St.-Amour (ECCC, Delta -- WRD), and Marie Auger-Méthé and PhD student Shabnam Shadloo (University of British Columbia, Vancouver) trapped Glaucous-winged Gulls (*Larus glaucescens*) around the BC portion of the Salish Sea. The main goal of this project is to examine food-web contamination and its implications for the physiological health of gulls that spend winter in the region. For outgroups, the crews also sampled on the west (Tofino and Ucluelet area) and north (Campbell River to Port Hardy) coasts of Vancouver Island, along BC's North Coast (Prince Rupert area), and in Haida Gwaii.

Author(s): Frederick (Ted) Leighton

I monitor the general populations and breeding success of colonial-nesting birds of Bear Island, Nova Scotia, one of two islands in the Annapolis Basin, a tidal bay off the Bay of Fundy. The island is maintained as a nature reserve by its Trustees, the Town and the Board of Trade of Digby, Nova Scotia. The island is uninhabited.

There are on the order of 300 nesting pairs of Herring Gull (*Larus smithsonianus*), 300 of Great Black-backed Gull (*Larus marinus*), 200 of Double-crested Cormorant (*Nannopterum auritum*),

40 of Great Blue Heron (*Ardea herodias*) and 100 burrows of Bank Swallow (*Riparia riparia*). There may be 10 nesting pairs of Canada Goose (*Branta canadensis*). These populations have remained stable over the past decade, although gull reproduction failed completely in 2018.

A recent book I co-authored with my late father includes a chapter about Bear Island, "The Emerald Isle" in: *People of Cove and Woodlot, Stories Across 100 Years of Memories*, by Ted Leighton and Alexander Leighton, March 2025, Moose House Publications, ISBN: 978-1-998149-62-9.

Author(s): Laurie Wilson (Environment and Climate Change Canada (ECCC) - Canadian Wildlife Service (CWS), Delta, British Columbia (BC))

Laurie Wilson (Environment and Climate Change Canada (ECCC) - Canadian Wildlife Service (CWS), Delta, British Columbia (BC)) coordinated the Pacific CWS Seabird Colony Monitoring Program. In 2024, population trends of breeding Ancient Murrelet (*Synthliboramphus antiquus*) and Cassin's Auklet (*Ptychoramphus aleuticus*) at 3 colonies (George Island, East Copper Island and West Rankine Island in the Gwaii Haanas National Park Reserve and Haida Heritage).

While on George Island, Global Positioning System (GPS) tracking devices were deployed on breeding Ancient Murrelets (Pathtrack Nanofix Geo) and non-breeding Ancient Murrelets (Lotek Argos Pinpoint 75) to compare movement and habitat-use patterns of both age categories and compare data for breeding adults across years (GPS tags were deployed on breeding Ancient Murrelets on George Island in 2019). Tagging field work was led by Alice Domalik (ECCC-CWS, Delta, BC). Vivian Pattison (ECCC-Wildlife Research Division (WRD), Sidney, BC), Patrick O'Hara (ECCC-CWS, Sidney, BC), Doug Bertram (ECCC-WRD, Sidney, BC) and Kerry Woo (ECCC-CWS, Delta, BC) will assist with analyzing the tracklogs.

The trip was conducted by ECCC-CWS staff in collaboration with Parks Canada to help strengthen interagency partnerships & help build on-island capacity to conduct seabird colony research in the future.

Field crew included Laurie Wilson, Alice Domalik, Kerry Woo, Wendy Easton (ECCC-CWS, Delta, BC), Meaghan Leslie-Gottschligg (ECCC-CWS, Delta, BC), Xiao Jun (Jim) Song (ECCC-CWS, Delta, BC), Pete Sinkins (Parks Canada, Skidegate, BC), Elin Price (Parks Canada, Skidegate, BC), Charlotte Huston (Parks Canada, Skidegate, BC), Chavonne Guthrie (Parks Canada, Skidegate, BC), and Glen Keddie (ECCC-CWS contractor, Smithers, BC).

Finally, Laurie continues with her monitoring of seabird bycatch in commercial salmon gillnet fisheries. Reports of bird entanglements from Fisheries and Oceans (DFO) test fisheries with observer programs and bycatch events reported by fishers are tallied; these data will be used to derive seabird bycatch estimates.

Europe

Author(s): Scott Moorhouse (High Arctic Gull Research Group)

Scott Moorhouse (High Arctic Gull Research Group) is continuing his studies of Iceland Gulls (*Larus glaucoides*). This includes completing additional work on the feeding ecology and behavior of breeding gulls of the *glaucoides* subspecies compared to other sympatric breeding species in southwestern Greenland, including Glaucous Gulls (*L. hyperboreus*), Great Black-backed Gulls (*L. marinus*), Lesser Black-backed Gulls (*L. fuscus*), and other gulls. Detailed field studies will be completed in July--August 2025. This work includes the collection of detailed data on habitat use, feeding behavior, and food use in representative study areas located in all the major habitat types used by these species in the Nuuk fjord area. Data are also being collected on colony locations and characteristics, plumage and other morphological characteristics, age class distribution, and other parameters. An additional aspect of this work is to compare the feeding ecology and behavior of *glaucoides* in this area, with the same aspects of breeding *kumlieni* and sympatric gull species on southwestern Baffin Island, Nunavut, Canada. This study is a continuation of my previous work on Iceland Gulls (Moorhouse, S.S. 2021. The feeding ecology and behavior of breeding Iceland Gulls *Larus glaucoides kumlieni* and comparisons with sympatric large *Larus* gulls on southwestern Baffin Island, Canada. *Marine Ornithology* 49:83--90; and Moorhouse, S.S. 2024. The distribution, abundance, and habitat use of wintering Iceland Gulls *Larus glaucoides thayeri* in Northern California and comparisons with other *Larus* gulls. *Marine Ornithology* 52:209--223).

Author(s): Steffen Oppel, Julius Morkunas (Lithuanian Ornithological Society), Rasa Morkune (Klaipėda University), Yann Rouxel (Royal Society for the Protection of Birds)

BirdLife Partners in Lithuania and the United Kingdom (Lithuanian Ornithological Society, Royal Society for the Protection of Birds) completed a 5-year project to trial techniques on how to reduce seabird bycatch (Long-tailed Duck, Velvet Scoter, Great Cormorant) in nearshore gillnet fisheries. Mitigation measures included predator-shaped kites attached to buoys holding the nets, and night fishing. Results indicate that the risk of seabird bycatch is greatly reduced (>50% reduction) if nets are retrieved prior to sunrise, while the deployment time can be as much as two hours before sunset. Kites had a small beneficial effect, and neither measure reduced target fish catch. The bycatch reduction is feasible if fishers deploy and retrieve nets within certain timeframes, which will require an additional trip, and therefore funding and cultural adjustments.

Global

Author(s): Rachael Orben (Assistant Professor -- Senior Research, Oregon State University), Adam Peck-Richardson (Faculty Research Assistant, OSU), Alexa Piggott (Faculty Research Assistant, OSU)

Rachael Orben (Assistant Professor -- Senior Research, Oregon State University), Adam Peck-Richardson (Faculty Research Assistant, OSU), and Alexa Piggott (Faculty Research Assistant, OSU) entered the sixth year of the Cormorant Oceanography Project. This interdisciplinary project is developing and deploying novel biologging tags on cormorants, shags, and penguins to collect oceanographic data while gaining insights into seabird ecology (Orben et al., 2025). 2024 continued to be a busy year with tag deployments on cormorant and penguin species across the globe. We supported the tagging effort of seven cormorant and two penguin species in ten different countries (including: Great Cormorants---Sweden, Lithuania, Germany, and Republic of Korea; Guanay Cormorants---Peru; Neotropic Cormorants---Brazil; Temminck's Cormorants---Republic of Korea; European Shags---Norway; Imperial Cormorants---Argentina; Socotra Cormorants---UAE; African Penguins---South Africa; Humboldt Penguins---Peru). We also continued to work with tag manufacturers (Ornitela) to refine GSP-GSM tags to measure salinity (conductivity + temperature) and to refine tag programming to improve tag power management. The resulting physical oceanography datasets were shared with oceanographers at Oregon State University. OSU researchers Jim Lerczak (Professor), Greg Wilson (Assistant Professor), Jessica Garwood (Assistant Professor), Xiaohui Liuare (Research Associate), and Leilane Passos (Research Associate) are processing bird-derived data to describe water column properties and to calibrate satellite-derived oceanographic models. Deployments with collaborators will continue in 2025 in Lithuania, Norway, Peru, India, Sweden, and Korea. This effort is funded by the Office of Naval Research.

Orben, R., Peck-Richardson, A., Piggott, A., Lerczak, J., Wilson, G., Garwood, J., Liu, X., Muzaffar, S., Foster, A., Naser, H., AlMusallami, M., Anker-Nilssen, T., Arnould, J., Berumen, M., Cansse, T., Cárdenas-Alayza, S., Christensen-Dalsgaard, S., Khamis, A., Carpenter-Kling, T., ... Zavalaga, C. (2025). Collaborating with Marine Birds to Monitor the Physical Environment Within Coastal Marine Protected Areas. *Oceanography*. <https://doi.org/10.5670/oceanog.2025e115>

Author(s): The Seabird Oceanography Lab (Rachael Orben, Adam Peck-Richardson, Michael McGuire)

The Seabird Oceanography Lab (Rachael Orben, Adam Peck-Richardson, Michael McGuire) completed the fourth assessment of the Pacific Flyway region Caspian Tern breeding population. In 2024, we conducted a comprehensive breeding population census by surveying every active and historical nesting location within the Pacific Flyway region. The need for a comprehensive census was motivated by growing concerns regarding previously documented population declines (Lawes et al. 2022) and by an outbreak of Highly Pathogenic Avian Influenza (HPAI) in Pacific Northwest Caspian terns in 2023, which resulted in a minimum observed mortality of 1,529 adults (Haman et al. 2024). The resulting regional breeding population estimates will be used to monitor the status of the Caspian Tern population in the Pacific Flyway region and allow for adaptive management practices for this population. This work was supported by U.S. Fish and Wildlife Service, Migratory Birds and Habitat Program (Portland, OR) and the many collaborators who shared observation data from Alaska to Baja California, Mexico.

Hawaii

Author(s): Emma Kelsey, Josh Adams (USGS Western Ecological Research Center), Joy Tamayose (Haleakalā National Park)

Long-Term Trends of 'ua'u at Haleakalā National Park

Josh Adams, Jackie Chistolini, and Emma Kelsey (USGS Western Ecological Research Center), in collaboration with Joy Tamayose (Haleakalā National Park) have been analyzing long-term records of 'ua'u (Hawaiian Petrel, *Pterodroma sandwichensis*) at Haleakalā National Park. The objectives of the effort are to determine long-term trends in 'ua'u nest occupancy and reproductive output as well as to summarize long-term trends in 'ua'u mortality.

Author(s): Linda Elliott (Hawai'i Wildlife Center), Dr. Juan Guerra

Hawai'i Wildlife Center (HWC):

Hawaiian archipelago seabird and shorebird rehabilitation patients treated at HWC September 1, 2024 to February 28, 2025 consisted of 763 seabirds (18 species) and 20 (3 species) shorebirds.

- Seabird species are listed in order of largest number cared for to lowest:
 - Wedge-tailed Shearwater (*Ardenna pacifica*)('Ua'u kani) - 680
 - The majority of these shearwaters were downed fledglings due to light pollution or impact with structures
 - White tern (*Gygis alba*) (Manu-o-Kū) -27
 - Most of the terns are orphaned chicks that are raised and soft-released
 - Sooty Tern (*Onychoprion fuscatus*) ('Ewa 'ewa) -10
 - Hawaiian Petrel (*Pterodroma sandwichensis*) ('Ua'u)-9
 - Leach's Storm-Petrel (*Oceanodroma leucorhoa*)-8
 - Bulwer's Petrel (*Bulweria bulwerii*) ('Ou)-7
 - Majority are downed fledglings with short stays in care
 - White-tailed Tropicbird (*Phaethon lepturus*) (Koa'e kea)-6
 - Black-winged Petrel (*Pterodroma nigripennis*) -- 2
 - Brown Booby (*Sula leucogaster plotus*) ('Ā)- 2
 - Brown Noddy (*Anous stolidus*) (Noio kōhā)- 2
 - Red-footed Booby (*Sula sula*) ('Ā)- 2
 - Sooty Shearwater (*Ardenna grisea*)- 2
 - Black Noddy (*Anous minutus melanogenys*) (Noio) - 1
 - Great Frigatebird (*Fregata minor palmerstoni*) ('Iwa) - 1
 - Laysan Albatross (*Phoebastria immutabilis*) (Mōlī) - 1
 - Masked Booby (*Sula dactylatra*) ('Ā)- 1
 - Red-tailed Tropicbird (*Phaeithon rubricauda*) (Koa'e 'ula)- 1

- Stejneher's Petrel (*Pterodroma longirostris*) - 1
 - Shorebirds:
 - Pacific Golden Plover (*Pluvialis fulva*) (Kōlea)-18
 - Ruddy Turnstone (*Arenaria interpres*) ('Akekeke) -1
 - Wandering Tattler (*Heteroscelus incanus*) ('Ūlili) - 1
-

Author(s): Jenni Learned and Jay Penniman (Maui Nui Seabird Recovery Project)

The Maui Nui Seabird Recovery Project (MNSRP) maintained ongoing recovery, monitoring, and management programs for listed and non-listed seabird species on Maui in 2024, and assisted in seabird monitoring and protection programs on Molokai.

1. Annual ornithological radar surveys for the endemic and endangered 'a'o (Newell's Shearwater, *Puffinus newelli*) and 'ua'u (Hawaiian petrel, *Pterodroma sandwichensis*) continued with surveys at fifteen sites around Maui throughout the month of June. Trends are consistent among all modern survey years (2021--2024) with stable or increasing rates at sites surrounding the large breeding population of 'ua'u on Haleakalā in east Maui.
2. Management of 'ua'u breeding habitat in the upper Nakula Natural Area Reserve and Kahikinui Forest reserve, including predator removal and reproductive success monitoring, continues to support greater management efforts to protect the Haleakalā 'ua'u population, in partnership with agencies including Haleakalā National Park, Hawai'i State Division of Forestry and Wildlife (DOFAW), and Invenenergy's Auwahi Wind. MNSRP monitored 115 'ua'u burrows in 2024 with a resulting reproductive success rate of 64%. The trapping program within the sites is expanding and adapting to predator presence, with the addition of new trap types including the automatically resetting NZ Autotraps AT220s.
3. MNSRP continues to maintain the predator exclosures at the Makamaka'ole seabird protection site in west Maui, and monitor for the attendance of breeding seabirds. Social attraction and nest boxes are established for 'ua'u, 'a'o, and 'akē'akē (Band-rumped Storm-petrel, *Hydrobates castro*). In 2024, for the first time, 'ua'u were documented visiting nest boxes during the breeding season. 'A'o presence was consistent compared to previous years, however, no chicks hatched. 'Akē'akē has not established to date.
4. 'Ua'u kani (Wedge-tailed Shearwater, *Ardenna pacifica*) have several coastal breeding sites established throughout Maui Nui and offshore islets. MNSRP maintains a long-term 'ua'u kani reproductive success study and banding program, and performs habitat management and predator removal at several locations. 'Ua'u kani respond well to management, and population growth continues annually. In addition, the location of the sites allows for educational and community focused events throughout the year, providing opportunity to involve the public in seabird conservation. Almost 1,300 chicks were banded in 2024 at seven separate events on Maui and Molokai, involving over one hundred partners and volunteers representing twenty-four separate groups and conservation organizations.

5. As agents of Hawai'i State Division of Forestry and Wildlife, MNSRP maintains a downed seabird hotline and responds to calls of downed or injured seabirds. Seabirds are recovered by trained staff, assessed, banded, and released or sent to the Hawai'i Wildlife Center for rehabilitation. MNSRP recovered 92 'ua'u kani and 20 'ua'u during the fledgling fallout season in 2024.
6. American Bird Conservancy supported MNSRP with assisting the Molokai Land Trust with trapping and seabird monitoring programs within the seabird protection site at Anapuka Dunes/Mokio Preserve, following the recent completion of a predator exclusion fence. 'Ua'u kani presence is growing at the site, with 29 chicks banded in 2024.

In addition to ongoing programs, MNSRP initiated a new project funded by the National Fish and Wildlife Foundation to survey for 'akē'akē presence across Maui using passive acoustic monitoring (PAM). While 'akē'akē are presumed to breed on Maui and carcasses are salvaged from time to time, breeding locations remain unknown. Songmeter Mini recording units (Wildlife Acoustics) were used to survey 66 individual sites in 2024, and partners at the Listening Observatory for Hawaiian Ecosystems (LOHE) lab at UH Hilo performed the data analysis. Haleakalā National Park conducted analogous surveys within National Park territory at 17 sites. 'Akē'akē were detected at 17 sites across the island, with high call densities at seven of the sites, suggesting nearby breeding aggregations. The survey will continue in 2025 to 1) survey additional locations and 2) refine the search for possible breeding aggregations at the sites with high call densities in 2024.

Author(s): Rachael Orben, Scott A. Shaffer, Leigh G. Torres, Lesley Thorne, Henri Weimerskirch, David A. Kroodsma, Dan Rapp, Yun-Xuan Lin, Autumn-Lynn Harrison

In January 2024, Scott Shaffer (San Jose State University; SJSU) and Yun-Xuan Lin (National Taiwan University) traveled to Midway Atoll to conduct the third season of Laysan and Black-footed Albatross (*Phoebastria immutabilis* and *P. nigripes*) tracking funded by the National Fish and Wildlife Foundation. This project aims to understand fine-scale behavioral interactions between albatrosses and the fishing vessels they encounter across their foraging range. A portion of the birds were deployed with radar-detecting biologging tags to provide *in situ* data on vessel presence. This project is a collaborative effort between Scott Shaffer (SJSU), Leigh Torres (Oregon State University; OSU), Henri Weimerskirch (French National Centre for Scientific Research; CNRS), Lesley Thorne (Stony Brook University), and David Kroodsma (Global Fishing Watch). Additional field support was provided by Dan Rapp and the US Fish and Wildlife Service (USFWS) Midway Atoll National Wildlife Refuge (NWR).

In January and February 2024, Yun-Xuan Lin, as part of her PhD research, tested the personality (boldness) of Laysan and Black-footed albatrosses. The test method followed Samantha Patrick and Henri Weimerskirch's study on Wandering Albatross, evaluating "how individuals respond to a novel object".

In 2024, a tagging project was initiated at Midway Atoll NWR to address the migratory connectivity and activity for two petrel species never previously tagged and with limited understanding of their at-sea distributions during breeding and non-breeding seasons. This is a collaborative project between Dan Rapp, Rachael Orben (OSU), Scott Shaffer (SJSU), Autumn-Lynn Harrison (Smithsonian Institution), and the USFWS. The project is funded by the Smithsonian Institution as part of The Migratory Connectivity Project. In late January and early February 2024, Dan Rapp deployed GPS loggers on breeding Tristram's Storm-petrels (*Hydrobates tristrami*) during late incubation and early chick rearing periods. In late February and March 2024, Dan Rapp deployed GPS loggers on breeding Bonin Petrels (*Pterodroma hypoleuca*) during late incubation and early chick rearing periods. To address non-breeding distributions of Bonin Petrels, Dan Rapp deployed GLS loggers on breeding Bonin Petrels in May 2024 during the chick-rearing period with plans for tag recovery in the 2025 breeding season.

Author(s): Anna Vallery, Meagan Selvig, and Beth Flint (U.S. Fish and Wildlife Service Marine National Monuments of the Pacific Biology Team)

Beth Flint, Anna Vallery, and Meagan Selvig (U.S. Fish and Wildlife Service (USFWS) Marine National Monuments of the Pacific Biology Team) visited Jarvis Island National Wildlife Refuge of Pacific Islands Heritage Marine National Monument in August, 2024. This was the first trip to Jarvis Island by USFWS in over six years. The team conducted rapid ecological assessments, documented burrow-nesting bird distribution and occupancy, redeployed remote monitoring tools and established a satellite enabled camera system. Observations suggest the nesting population of burrow-nesting seabirds, particularly Tropical Shearwaters (*Puffinus bailloni*), and ground nesting seabirds are increasing. Population estimates for the other breeding seabirds on island, including Sooty Tern (*Onychoprion fuscatus*), Lesser Frigatebird (*Fregata ariel*), Blue-Gray Noddy (*Procelsterna cerulea*), Masked Booby (*Sula dactylatra*), and others were also made. Reports are forthcoming.

Anna Vallery, Daniel Link (USFWS Papahānaumokuākea Marine National Monument), and Jon Plissner (USFWS Midway Atoll National Wildlife Refuge), with support from the Papahānaumokuākea Marine National Monument team, initiated a project to develop Laysan (*Phoebastria immutabilis*) and Black-footed Albatross (*Phoebastria nigripes*) monitoring protocols using drones and machine learning tools on Midway in December of 2024. This project is slated to be a three year project, with the goal of developing workflows and automated detection tools for digitizing drone imagery of large seabird colonies, both at Midway and throughout the Northwest Hawaiian Islands.

Non-Pacific United States

Author(s): Julia Gulka, Evan Adams, Kate Williams, Kim Lato (Biodiversity Research Institute), Lesley Thorne, Esther Nosazeogie (Stony Brook University), Doug Nowacek (Duke University)

Project WOW: Wildlife and Offshore Wind

The goal of this project is to understand the impacts to wildlife (including seabirds) from the first commercial-scale offshore wind development in the U.S. Atlantic. As part of this effort, we have been deploying GPS-GSM tags on Great Black-backed Gulls (*Larus marinus*, GBBG) (n=60) and Northern Gannets (*Morus bassanus*, NOGA) (n=60) in Massachusetts, Rhode Island, and New York with a focus on year-round movement for GBBG and non-breeding season movement patterns for NOGA in relation to offshore wind development. Tags were deployed during the 2023-2024 breeding seasons for GBBG and during fall/winter 2023-2025 for NOGA using at sea capture techniques. During deployments we have also been collecting blood and feathers for stable isotope analysis, contaminants, High Pathogenic Avian Influenza (HPAI), parasites, and other related efforts along with diet and fecal samples for eDNA analysis. Spring 2025 is the final planned tag deployment for the project, with future focus on data analysis.

Northern California

Author(s): Kirsten Lindquist (Greater Farallones Association and NOAA Affiliate GFNMS/CBNMS), Jan Roletto (NOAA GFNMS/CBNMS)

Beach Watch 2024 summary

2024 marked the 31st year of Beach Watch, the coastal monitoring program of Greater Farallones and Cordell Bank National Marine Sanctuaries (GFNMS/CBNMS) and Greater Farallones Association. In 2024, Beach Watch monitored 60 survey sites over 5 counties in Northern California: Mendocino south to San Mateo counties. Volunteers and staff collect data on coastal birds, mammals, human activities, entanglements, oil pollution, and status of streams and lagoons. In 2024, volunteers contributed over 11,753 hours of service to NOAA, equaling over \$393,607.97 (hours x \$33.49).

In 2024, seabird deposition was higher than our 30-year mean deposition rates (i.e., 1993--2023 baseline deposition rates). This increase was driven by higher rates for three species of seabirds: Cassin's Auklet (*Ptychoramphus aleuticus*), Brown Pelican (*Pelecanus occidentalis*), and Brandt's Cormorant (*Urile penicillatus*). Cassin's Auklets had a 125% increase in mean deposition rates (from a baseline rate of 0.03 birds/km to 0.07 birds/km in 2024). Cassin's Auklet deposition was driven by January 2024 storms; 72% were adults and 39% were immature. Brown Pelican had a 95% increase in mean annual deposition rate (from a baseline of 0.021 birds/km to 0.041 birds/km in 2024); approximately 33% were adults. Brandt's Cormorant had a 95% increase in mean annual deposition rate (from a baseline rate of 0.089 birds/km to 0.122 birds/km, in 2024). Approximately 54% of the dead Brandt's Cormorants were adults, 39% were immature (aged to be second- and third-year birds).

In contrast to the higher deposition rates overall, two of our most common species had average or lower than average deposition rates; Common Murre (*Uria aalge*) (long-term mean baseline 0.37 birds/km and 0.37 birds/km in 2024) and Northern Fulmar (*Fulmarus glacialis*) (long-term mean 0.154 birds/km and 0.023 birds/km in 2024).

For marine mammals, the California Sea Lion (*Zalophus californianus*) annual deposition rate was higher, resulting in a 18% increase in mean deposition rate of 0.051 mammals/km to 0.06 mammals/km in 2024).

Beach Watch data are publicly accessible through the GFA data portal:

<https://bwonline.beachwat.ch/BeachWatchData.php>. Researchers and managers can contact Kirsten Lindquist, KLindquist@farallones.org or Jan.Roletto@noaa.gov for raw data.

For more information on data sharing, accessing to raw data, details of surveys for beach closures, stream and lagoon status, human activities, oil pollution, demographics of beach vertebrates, or relative abundance of beach wrack, please contact Kirsten Lindquist, KLindquist@farallones.org or Jan.Roletto@noaa.gov.

Author(s): Jaime Jahncke (Point Blue Conservation Science), Meredith Elliott (Point Blue Conservation Science), Jan Roletto (Greater Farallones & Cordell Bank National Marine Sanctuaries), Dani Lipski (Greater Farallones & Cordell Bank National Marine Sanctuaries)

2024 ACCESS Highlights

Applied California Current Ecosystem Studies (ACCESS) is a collaborative effort of GFNMS/CBNMS and Point Blue Conservation Science. Since 2004, the ACCESS scientists have collected at-sea data on birds, marine mammals, water column health and productivity, forage species for birds and mammals, and samples for ocean acidification, environmental DNA, and phytoplankton that can lead to harmful algal blooms. Our data are used to understand status and trends of sanctuary resources, ecosystem health, and response to climate change. Typically, we conduct at-sea surveys three times a year, during the early portion of the upwelling season, peak upwelling, and post-upwelling and the transition season. In 2024, we had reduced sampling due to mechanical issues with our research vessel *Fulmar*.

We were not able to sample during peak seabird breeding and chick rearing in July 2024 due to issues with our research vessel.

In May 2024, on the NOAA ship R/V *Bell M. Shimada*, we conducted a piggyback pilot study to sample for microplastics in the water column. We have mixed opinions about collecting the samples, due to the high cost of analyses, which require clean rooms; we don't have funding for the samples we collected. We're hoping to find future funding and looking into how this at-sea sampling can be complementary to microplastics studies on SE Farallon Island.

Highlights of 2024 included numerous krill and small schooling fish along the 200 m isobath (e.g., the shelf break) and across the continental shelf. Following and foraging on the zooplankton and fish were numerous blue, humpback, and fin whales, Common Murres (*Uria aalge*), Cassin's Auklets (*Ptychoramphus aleuticus*), and a variety of gulls, shearwaters, albatrosses, and jaegers. Krill (especially adult age classes) were abundant in the spring months, while fish and gelatinous zooplankton (e.g., pyrosomes) were more abundant in

September. Whales were abundant across the shelf, where they are more vulnerable to collisions with ships.

Some fun facts...

In September 2024, we completed our 72nd research cruise. Over the past two decades, we've been at sea nearly 400 days and sampled more than 24,000 km of water; that's equal to traveling across the United States more than five times! We counted more than 40 million zooplankton, more than 200,000 birds, and nearly 9,000 whales.

Author(s): Emma Kelsey, Josh Adams (USGS Western Ecological Research Center), David Pereksta (Bureau of Ocean Energy Management; BOEM)

Josh Adams and Emma Kelsey (USGS Western Ecological Research Center), in collaboration with David Pereksta (Bureau of Ocean Energy Management; BOEM), have updated their index of marine bird vulnerability to collision and displacement with offshore wind energy infrastructure in the Pacific Outer Continental Shelf. The original report was published in 2017, and the new report is in the process of being published.

Author(s): Laney White, Emma Kelsey, Gavin Haight, Josh Adams (USGS Western Ecological Research Center; USGS WERC), Alex Rinkert (California State Parks)

Laney White, Emma Kelsey, Gavin Haight, and Josh Adams (USGS Western Ecological Research Center; USGS WERC), with observer support from Alex Rinkert (California State Parks), continued long-term (1999--present) at-sea Marbled Murrelet (*Brachyramphus marmoratus*) surveys in Conservation Zone 6 in central California to estimate murrelet abundance reproductive output in 2024. This long-term monitoring project was previously funded by the Luckenbach Oil Spill Trustee Council and will be funded through 2028 by California State Parks. The annual report is available upon request and the data will be published every five years:
<https://www.usgs.gov/centers/werc/science/marbled-murrelet-surveys-central-california-coast>.

Author(s): Julie Thayer (Farallon Institute), Morgan Barnes (National Park Service)

We have monitored Alcatraz seabird population size, breeding phenology, and productivity since the island was colonized by Brandt's Cormorants in the early 1990s. Disturbance to wildlife is a concern because Alcatraz is the most heavily-visited tourist destination in Northern California. Island visitation returned to full capacity in 2022 following two years of reduced or no visitation during the COVID-19 pandemic in 2020--2021.

After a record number of Brandt's Cormorants in 2023 (almost 10,000 birds, representing a significant proportion of the meta-population), the Alcatraz breeding population and productivity were significantly lower in 2024. Heavy and recurring late rains, warm oceanic conditions, and fewer foraging opportunities likely contributed to this drop in breeding cormorants on the island.

The Western Gull population numbers remained stable, but 2024 productivity was low. However, Pigeon Guillemot numbers continue to increase, as have Black Oystercatcher populations, although oystercatcher productivity remains low. California Gulls and Pelagic Cormorants no longer breed on Alcatraz Island.

One adult Western Gull carcass in 2024 tested positive for Highly Pathogenic Avian Influenza, although all subsequent birds tested have been negative (including one Brandt's Cormorant in early 2025).

Southern California

Author(s): Gavin Haight, Josh Adams, Laney White, and Emma Kelsey (USGS Western Ecological Research Center; USGS WERC)

Gavin Haight, Josh Adams, Laney White, and Emma Kelsey (USGS Western Ecological Research Center; USGS WERC), in collaboration with David Pereksta (Bureau of Ocean Energy Management; BOEM), are working to expand the Motus Wildlife Tracking System in central and southern California with a focus on increasing tracking capacity for seabirds and bats off southern-central California and in the Southern California Bight. To date, 18 new stations have been added to the network. They plan to deploy Motus tags on three species of breeding seabirds in the Channel Islands this spring: Ashy Storm-petrels (*Oceanodroma homochroa*), Cassin's Auklets (*Ptychoramphus aleuticus*), and Western Gulls (*Larus occidentalis*). The Western Gulls will also carry GPS-GSM tags.

<https://www.usgs.gov/centers/werc/science/birds-bats-and-beyond-networked-wildlife-tracking-southern-california-bight>

Josh Adams and Laney White (USGS WERC), in collaboration with Matthew McKown and Abram Fleishman (Conservation Metrics Inc.), and with support from David Pereksta (BOEM) are working on manual, low-taxonomic identification of targets detected using a machine learning model in applied to aerial imagery collected off southern-central California between 2018--2021.

Washington & Oregon

Author(s): Josh Adams, Laney White, Gavin Haight, Emma Kelsey, and Jackie Chistolini (USGS Western Ecological Research Center; USGS WERC)

Leach's Storm-Petrel Nesting Density in Oregon Coast National Wildlife Refuge Complex

Josh Adams, Laney White, Gavin Haight, Emma Kelsey, and Jackie Chistolini (USGS Western Ecological Research Center; USGS WERC) assessed the nesting density of Leach's Storm-Petrel (*Hydrobates leucorhous*) and presence of other burrowing seabirds on 11 islands in the Oregon Coast National Wildlife Refuge Complex with support from Refuge staff. In addition to on-the-ground burrow counts, occupancy assessments, and habitat classification, aerial imagery was collected for orthoDEMs to aid in habitat descriptions and long-term monitoring of island change. The report is forthcoming.

Author(s): Rachael Orben, Will Kennerley, Luke Stuntz, Colton Veltkamp, Travolis Williams, Maria Nanau, Aya Attal, Hannah Motta, Eliza Wesemann, Keenan Yakola, Sara Maxwell, Isaiah Taylor (and collaborating institutions)

Yaquina Head Seabird Monitoring: 2024 marked the 18th consecutive year of seabird monitoring at Yaquina Head Outstanding Natural Area in Newport, Oregon, and the 4th consecutive year of monitoring at Pirate Cove in Depoe Bay, Oregon. Will Kennerley (Faculty Research Assistant, Oregon State University; OSU), Aya Attal (National Science Foundation Research Experiences for Undergraduates (REU) Intern), Travolis Williams (OSU Vanguarding an Inclusive Ecological Workforce (VIEW) Fellow), Hannah Motta (Environment for the Americas Intern), and Rachael Orben (OSU) conducted reproductive monitoring for Common Murres (*Uria aalge*) and Brandt's and Pelagic cormorants (*Urile penicillatus* and *U. pelagicus*). Diet composition data for murres were also collected. Heavy Bald Eagle (*Haliaeetus leucocephalus*) predation again delayed murre reproduction at Yaquina Head and few murres managed to fledge chicks at this site. In contrast, at Pirate Cove---where eagle disturbance is minimal---murres maintained high productivity. This long-term study is funded in-part by the Bureau for Land Management (BLM), US Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), National Science Foundation (NSF), and OSU.

Columbia River Salmonids & Piscivorous Waterbirds: In 2024, the OSU Seabird Oceanography Lab (Rachael Orben, Adam Peck-Richardson, Alexa Piggott, and Will Kennerley) worked with Real Time Research, Inc. (Allen Evans, Nathan Banet, Helen Kreuger, Danielle Devincenzi, and Quinn Payton) on the long-term monitoring of Caspian Tern (*Hydroprogne caspia*), Double-crested Cormorant (*Nannopterum auritum*), American White Pelican (*Pelecanus erythrorhynchos*), and gull populations in the Columbia River Basin. The 2024 objectives were to (1) assess the distribution and size of piscivorous waterbird colonies, (2) estimate colony-specific predation/consumption rates on Endangered Species Act (ESA) listed salmonid populations, and (3) estimate cumulative effects of predation on juvenile salmonid survival. Monitoring of colonies was conducted from the air, by boat, and/or from shore. Three aerial surveys were conducted during May and June. Colony size was estimated using high-resolution aerial imagery corresponding with the peak in nesting activity at each colony and enumerating visible birds using ArcGIS. Predation rates were estimated by scanning for smolt passive integrated transponder (PIT) tags deposited on bird colonies. This project was funded by Bonneville Power Administration and Grant County Public Utility District via oversight and approval from the Priest Rapids Coordinating Committee.

Marine Offshore Species Assessments to Inform Clean Energy (MOSAIC) Project: The Seabird Oceanography Lab, in collaboration with OSU's Marine Mammal Institute, completed the last of six, two-week cruises for pelagic seabirds off Oregon and Northern California in April 2024. Now, Rachael Orben and Will Kennerley are working with researchers from OSU's Marine Mammal Institute (Lisa Ballance, Leigh Torres, and Dawn Barlow) to construct species distribution models around proposed offshore wind areas. This project was funded by the U.S. Department of Energy.

Tufted Puffin Chick Diets: Eliza Wesemann (Utah State University undergraduate), with support from Rachael Orben and Will Kennerley, performed a third complete season of Tufted Puffin (*Fratercula cirrhata*) bill load photography at the Haystack Rock colony in Cannon Beach, Oregon. This work continues OSU's efforts to document Tufted Puffin prey in response to the drastic decline of this species' breeding population in the state. Funding support came from the Oregon Wildlife Foundation and Friends of Haystack Rock.

Predators of Leach's Storm-petrels (*Hydrobates leucorhous*): The Seabird Oceanography Lab (Luke Stuntz, Colton Veltkamp, Maria Nanau), in collaboration with the United States Fish and Wildlife Service, conducted monitoring of terrestrial predator activity at important storm-petrel colonies along the southern Oregon coast from March 2024 through February 2025. We deployed on-island camera traps, conducted monthly predator sign surveys on the islands and adjacent mainland areas, and analyzed the contents of mustelid scat to track trends in seabird predation. Both river otters and American mink were major predators of Leach's Storm-petrels in 2024, with smaller amounts of predation on gulls, cormorants, and various alcids. Non-invasive genotyping was used to estimate the size, structure, and movements of river otter groups active at these seabird islands. Results from this project are expected to be published in 2025.

Oregon Seabird Tracking: The Seabird Oceanography Lab (Rachael Orben, Will Kennerley, Luke Stuntz, Colton Veltkamp), with Sara Maxwell and Isaiah Taylor (University of Washington Bothell), Don Lyons (Oregon State University and National Audubon Society Seabird Institute) and Keenan Yakola (Oregon State University PhD candidate) expanded seabird tracking work on the southern Oregon Coast. GPS tags were deployed on Western Gulls (*Larus occidentalis*), Rhinoceros Auklets (*Cerorhinca monocerata*), and Leach's Storm-petrels (*Hydrobates leucorhous*) breeding on Hunter's Island, near potential offshore wind development areas. Funding in part came from the U.S. Fish and Wildlife Service, National Audubon Society's Seabird Institute and the University of Washington's Royalty Research Fund. We are expecting to continue similar work in 2025 with Rhinoceros Auklets and Leach's Storm-petrels.